

PROJECT FACT SHEET

CONTRACT TITLE: Interdisciplinary Study of Reservoir Compartments and Heterogeneity

ID NUMBER: DE-AC22-93BC14891

B & R CODE: AC1005000

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PROJECT SITE

CITY: Golden

STATE: CO

CITY: Denver

STATE:

CITY:

STATE:

CONTRACT PERFORMANCE PERIOD:

09/29/1993 to 12/28/1996

PROGRAM: Supporting Research

RESEARCH AREA: Rsvr Characterization

FUNDING (\$1000'S)	DOE	CONTRACTOR	TOTAL
PRIOR FISCAL YRS	753	191	944
FISCAL YR 1997	0	0	0
FUTURE FUNDS	0	0	0
TOTAL EST'D FUNDS	753	191	944

OBJECTIVE: The major project objective is to help move small American businesses (oil and gas independent operators) from traditional practices in oil and gas reservoir management to an improved integrated team approach making better use of information and the expertise of people. This objective is being accomplished in two ways: (1) Specific examples resulting from our field study, and (2) A general manual documenting the process of integrating data and people from the discipline of geology, geophysics, and petroleum engineering. This manual will present a new and powerful approach for optimizing the economic value of domestic oil and gas resources.

METRICS/PERFORMANCE:

Products developed: Specific examples of integration have resulted from the field study. A general manual documenting the process of integrating data and people from the disciplines of geology, geophysics, and petroleum engineering will be developed.

PROJECT DESCRIPTION:

Background: There is an industrial need for a comprehensive system or series of systems to economically detect and exploit untapped or bypassed hydrocarbons associated with compartments in already discovered reservoirs. Industry needs accurate reservoir descriptions, developed through the integration of geology, geophysics, and petroleum engineering to more fully exploit these reservoirs. Petrophysical properties, obtained from cores and well logs, as well as the size of the reservoir, size of reservoir compartments, transmissibility across barriers separating compartments and probable locations of compartments need to be quantified through this interdisciplinary effort.

Work to be performed: An actual oil field in the Denver Julesburg Basin in Colorado was selected to test the methods of integration. The Denver Julesburg Basin has been one of the most active in the country and provides an excellent environment to test concepts of integration. Description of a highly compartmentalized Terry sandstone reservoir is the focus of the integrated team approach. In compartmentalized reservoirs wells recover less than expected. In this regard, our field study in the Denver Julesburg Basin will be a model for many other fields in the United States. The analysis of the Terry sandstone reservoir will; (1) Provide specific examples of integration, and (2) Provide the basis for a general manual documenting the process of integrating data and people from the disciplines of geology, geophysics, and petroleum engineering. This manual will present a new and powerful approach for optimizing the economic value of domestic oil and gas resources.

PROJECT STATUS:

Current Work: The project was completed in December 1996.

Scheduled Milestones:

General manual documenting the process of integrating data and people from the disciplines of geology, geophysics, and petroleum engineering

10/96

Accomplishments: Core descriptions, petrophysical analysis, and minipermeameter results were integrated to develop a correlation to estimate permeability from log derived data. The production data was integrated into the analysis. The integration of the data from these sources provides an approach that improves volumetric reserve estimates and identification of reservoir compartments.

A strategy for the integration of data and people was developed. The strategy does not include the words geology, geophysics, or petroleum engineering. Rather, the focus is on problem definition and objectives. Critical information needed to reach the objects are identified. For example, net pay estimates may be critical for reaching the project objectives. The identified critical information needs lead to data requirements. The economic scope and project objectives are revised as the available data and the data needs are assessed. The critical information needs are not intended to say for example, "Do a Geologic Study," but rather are intended to focus efforts on the integration of data and people that will answer the critical information needs. Successful integration does away with the compartmentalization of the disciplines and places the focus on getting the best cost-effective solution to the problem. Criteria should be developed to judge the economic criteria. The criteria establish the basis for recommendations and action plans. Similar to T.C. Chamberlain's, "The Method of Multiple Working Hypothesis", the General Strategy for Integration is more than a procedure within which to operate. It is mode of thought when analyzing a multidisciplinary problem. When used, it provides improved results through more effective integration by subordinating a parochial focus to an integrated focus without boundaries.